

# PROPORTION AIR

THE FUTURE OF CONTROL™



## Flow Control

### CLOSED LOOP

- \* "Real time" flow control
- \* Ideal for use in active flow control
- \* Differential pressure technology
- \* Pressure compensated models available
- \* Flow ranges as low as 2-20 SCFH
- \* Flow ranges as high as 25-250 SCFM

## PROPORTION-AIR'S "REAL TIME" FLOW CONTROL

Proportion-Air, Inc. F-Series flow monitors <sup>1</sup> are the heart of Proportion-Air's new "Real Time<sup>2</sup>" flow control system.

Proportion-Air's electro-pneumatic controls, which have been a staple of the industry for over 20 years, can be electronically reconfigured to accept feedback from our F-Series flow monitors. This combination of components provides a complete flow control package for flow ranges as low as 2-20 SCFH (0.016-0.16 L/SEC) to 250 SCFM (118 L/SEC). Because the feedback is "Real Time", the result are a series of flow controllers that respond instantly to change in command or system fluctuations. This fast response allows manufacturers and machine builders to use flow control in applications using high cycle rates "Real Time" response can even allow for increased cycle rates thus higher productivity.

<sup>1</sup> For complete functional description on the F-Series flow monitor, refer to page 8 & 9 of this brochure.

<sup>2</sup> Typically < 10ms.

## CLOSED LOOP FLOW CONTROL ASSEMBLIES

Three different assemblies of Proportion-Air, Inc. closed loop flow control are available for a variety of different applications: F-Series-FQPV, F-Series-FQB3, and F-Series-FQB2/PSR.

### F-Series & FQPV Assembly

F-Series flow monitor coupled with an FQPV, ultra high resolution control valve, to produce a closed loop flow control that is capable of controlling from as high as 60 SCFH (0.47 L/SEC).

### F-Series & FQB3 Assembly

F-Series flow monitor coupled to an FQB3, high flow control valve, to produce a closed loop flow control that is capable of controlling flow as high as 25 SCFM (11.8 L/SEC).

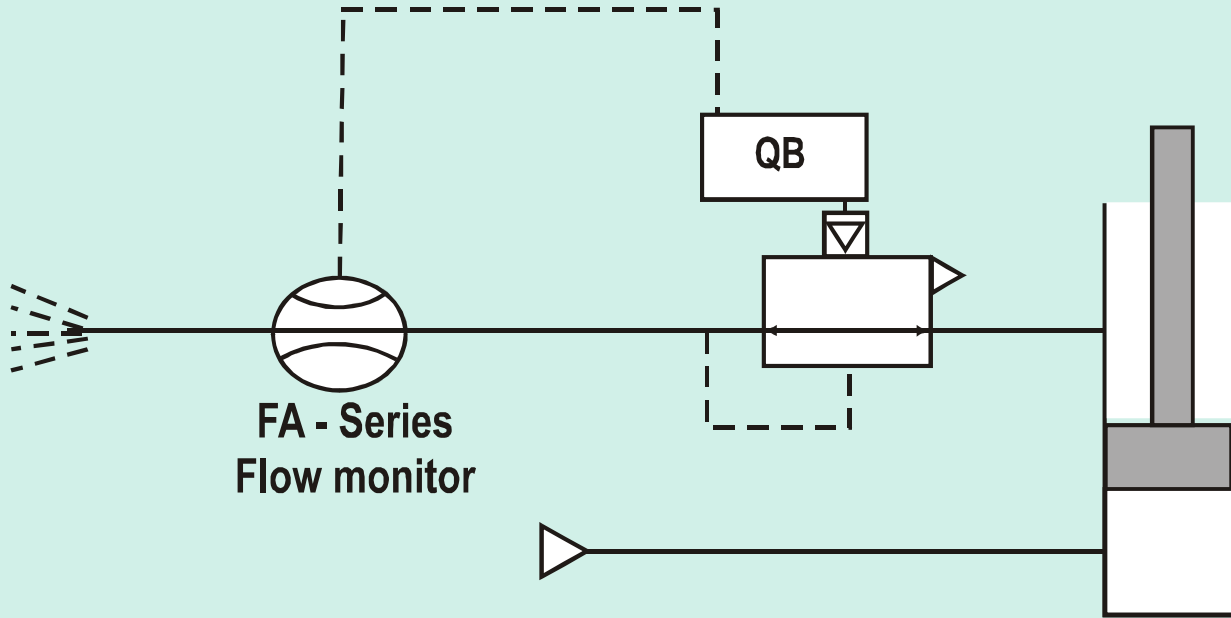
### F-Series & FQB2/PSR Assembly

F-Series flow monitor coupled to an FQB2 assembled to a PSR, air piloted regulator. The use of the PSR, allows control as high as 250 SCFM (118 L/SEC) and port sizes from 1/4" to 1-1/2" NPT.

Contact one of our "Factory Trained" Distributors or call our Application Specialist for assistance with specifying the components which are exactly suited to your application.

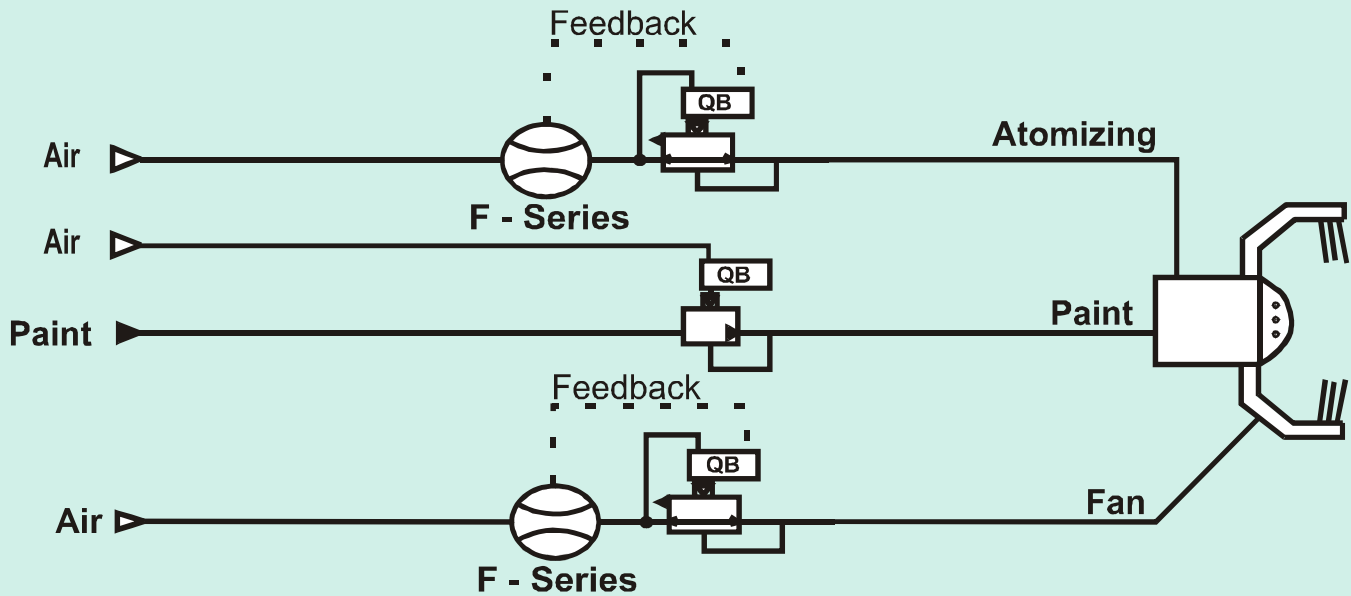
**Closed loop electro-pneumatic controls are our *only* business.  
Our competitors are making thousands of products one way,  
We manufacture *one* product *thousands* of ways.**

**SPEED CONTROL**



QB2 control valve receives feedback from an F-Series flow monitor.  
By controlling the flow out of the extending cylinder, cylinder speed is controlled

**SPRAYING & COATING**



QB2 and F-Series combination rapidly tracks requested flow rates, allowing immediate corrections, on-the-fly changes and spray pattern profiles

# FLOW ASSEMBLY GENERAL SPECIFICATIONS & PERFORMANCE CHARACTERISTICS

ELECTRICAL	MINIMUM	TYPICAL	MAXIMUM
POWER REQUIREMENTS	15VDC	-	24VDC
SUPPLY CURRENT			
VOLTAGE	1VDC	-	60mA
CURRENT	5.6mA	-	80mA
ANALOG OUTPUT			
VOLTAGE	1VDC	-	10VDC
SINKING CURRENT	5.6mA	-	20mA
SOURCING CURRENT	5.6mA	-	20mA

MECHANICAL	MINIMUM	TYPICAL	MAXIMUM
MAXIMUM INLET PRESSURE	-	165 PSIA (11.37 BARA)	-
CALIBRATED FLOW RANGE			
FQPV / F-SERIES	25 SCFH (0.2 L/SEC)	-	1 SCFM (0.47 L/SEC)
FQB3 / F-SERIES	1 SCFM (0.47 L/SEC)	-	25 SCFM (11.80 L/SEC)
QB2-PSR / F-SERIES	25 SCFM (11.80 L/SEC)	-	250 SCFM (118 L/SEC)
ACCURACY	-	+/- 4% F.S.	-
REPEATABILITY	-	+/- 0.25% F.S.	-
RESPONSE TIME	-	< 10 ms	-
SHOCK RATING	-	25 G's	-
TURNDOWN RATIO	-	10 to 1 <sup>1</sup>	-
END CONNECTIONS (PORT SIZE)		1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2" NPT or BSPP	

<sup>1</sup> Turndown ratio of 10:1 allows accuracy of 10 to 100% of flow range. Zero point is at zero flow.

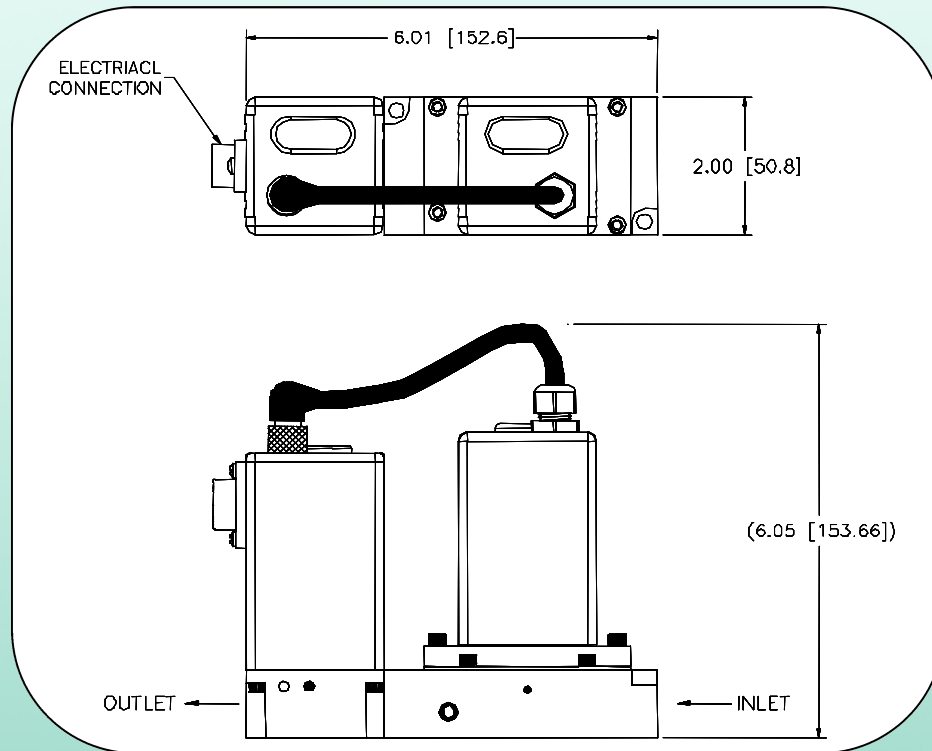
PHYSICAL	MINIMUM	TYPICAL	MAXIMUM
MEDIA WORKING TEMPERATURE	32°F (0°C)	-	122°F (50°C)
AMBIENT TEMPERATURE	32°F (0°C)	-	158°F (70°C)
TEMPERATURE SENSITIVITY	-	0.25% / °C Relative to reference conditions of 21°C	-
WEIGHT			
FQPV / F-SERIES	-	1.3 LBS (0.59 KG)	-
FQB3 / F-SERIES	-	1.7 LBS (0.77 KG)	-
QB-PSR / F-SERIES		Varies by port size	
ACTUATOR HOUSING RATING		IP65	

MATERIALS	
F-SERIES	Elastomers - Buna-N, Manifold - Aluminum anodized, Transducer - Silicon, Aluminum
FQPV	Elastomers - Fluorocarbon, Manifold—Brass, Transducer—Silicon, Aluminum
FQB3	Elastomers - Buna N, Manifold - Aluminum Nickel Plated, Valves - 430FR SS, 360 Brass, Seal material: Viton & Buna-N, Transducer - Utem 1000, Aluminum
QB2-PSR	(QB2) Elastomers - Fluorocarbon, Manifold—Brass, Transducer—Silicon, Aluminum (PSR) Elastomers - Nitrile, Body - Zinc (PSR6 & 8 - Aluminum), Dome - Aluminum, Internal - Nylon, Brass, Aluminum, 302 SS

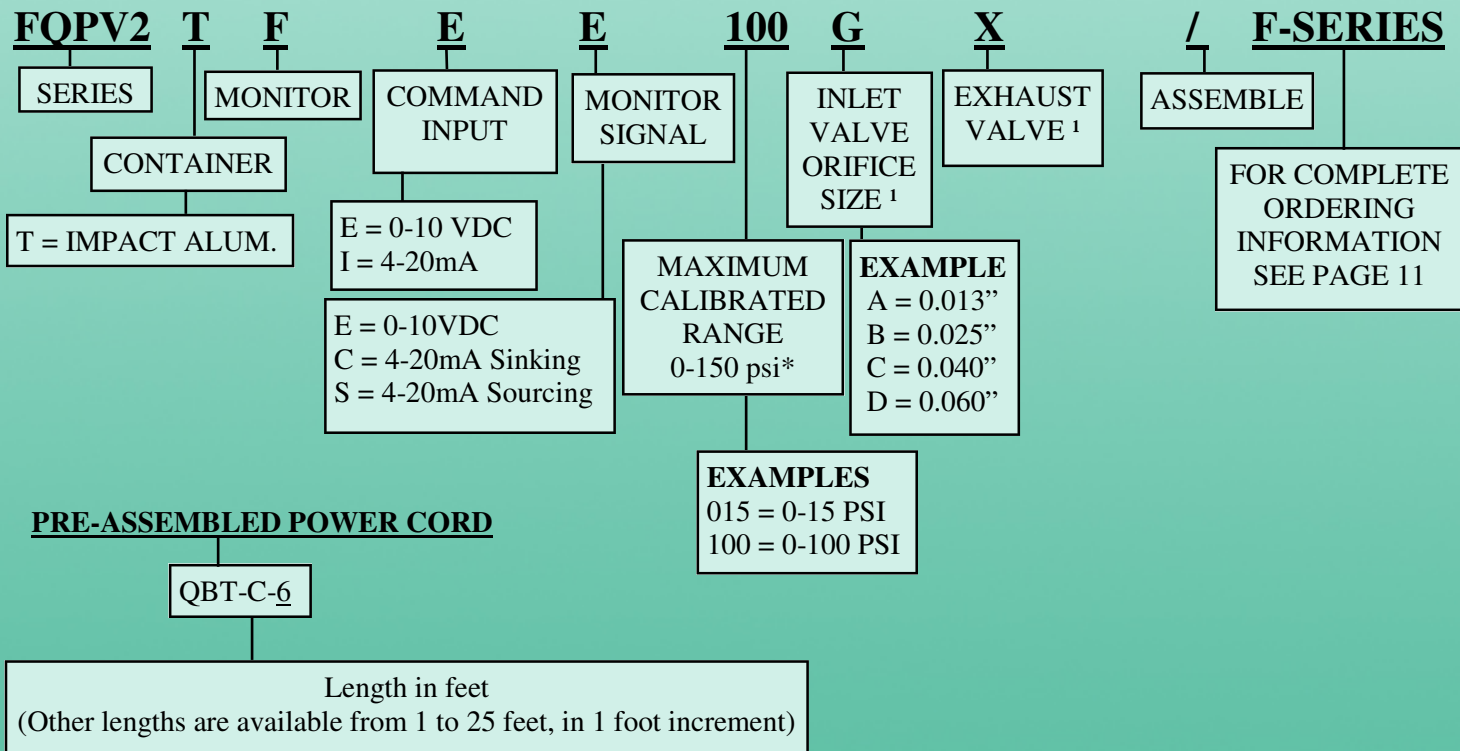


# DIMENSIONS FQPV & F-SERIES

DIMENSIONS ARE FOR REFERENCE USE ONLY. DIMENSIONS ARE IN INCHES



## FQPV ORDERING INFORMATION



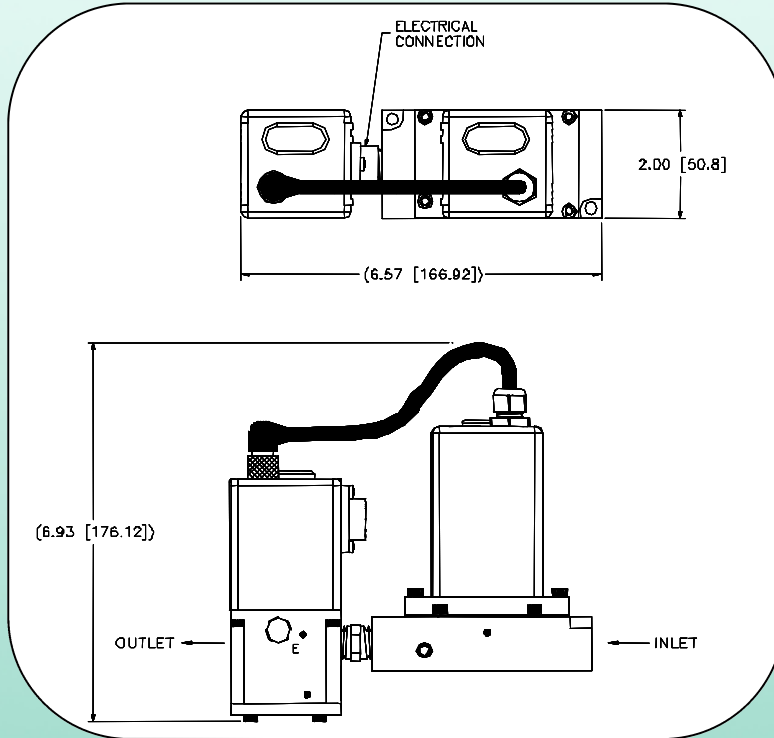
<sup>1</sup> Inlet valves orifice size and the exhaust valve are factory determined based on the application's flow and pressure specs.

<sup>2</sup> Bleed orifice is required when the QPV is used in an application that is static (no flow). Dynamic applications (under flow) do not need a bleed orifice to function properly.

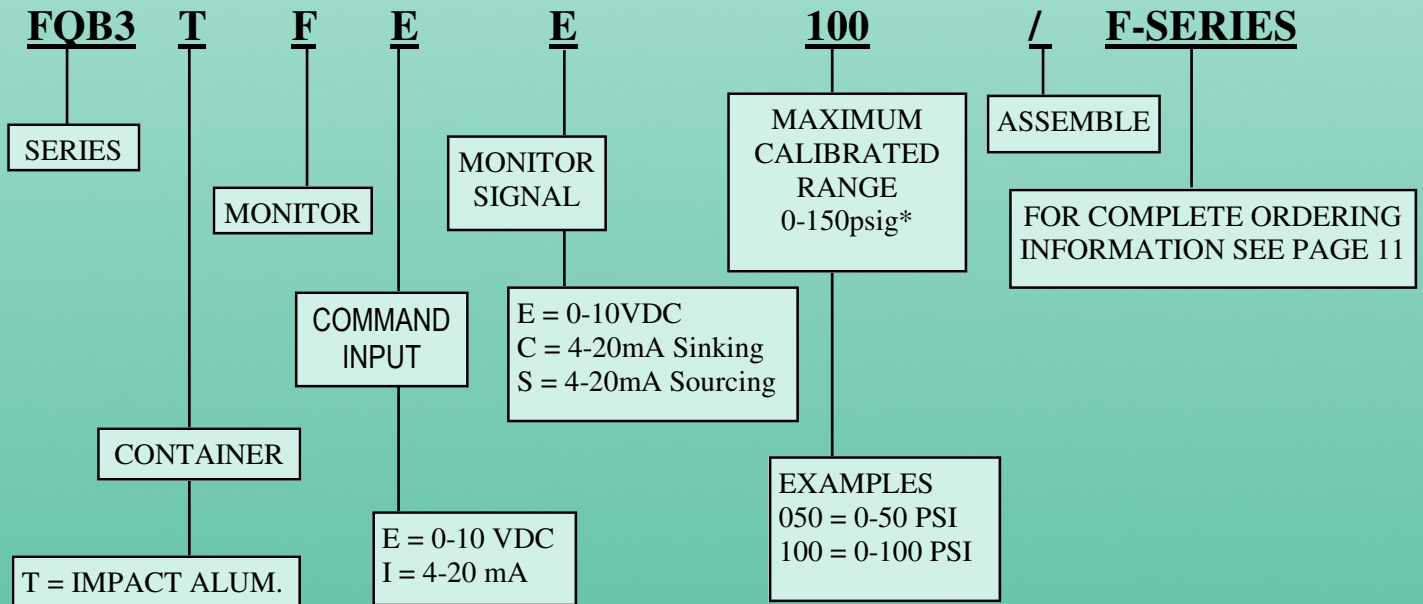
Consult our Application Engineering Department for your specific application needs. We are here to help you.

# DIMENSIONS FQB3 & F-SERIES

DIMENSIONS ARE FOR REFERENCE USE ONLY. DIMENSIONS ARE IN INCHES



## FQB3 ORDERING INFORMATION



### PRE-ASSEMBLED POWER CORD

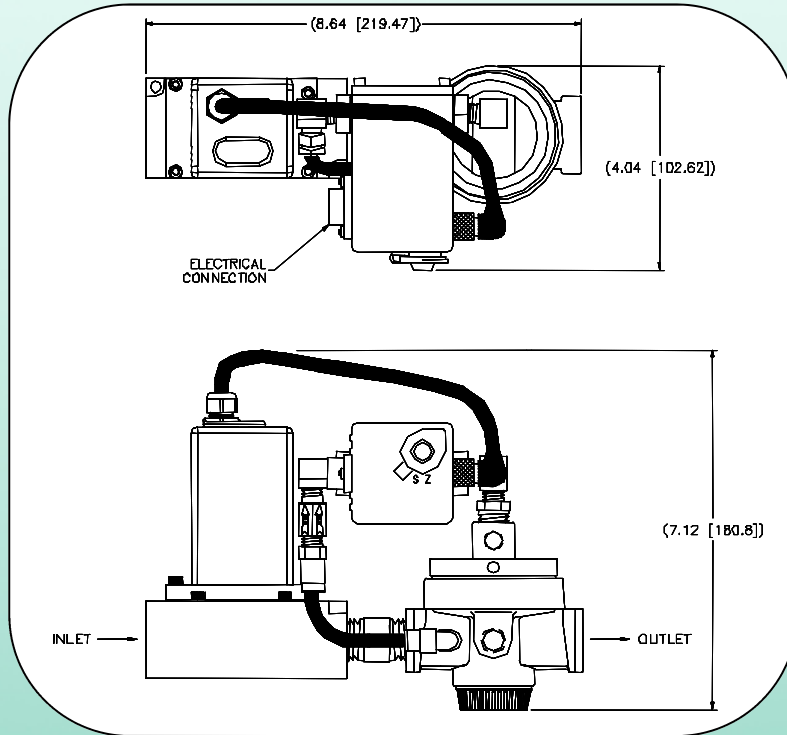
QBT-C-6

Length in feet  
(Other lengths are available from 1 to 25 feet, in 1 foot increment)

# DIMENSIONS QB2-PSR & F-SERIES

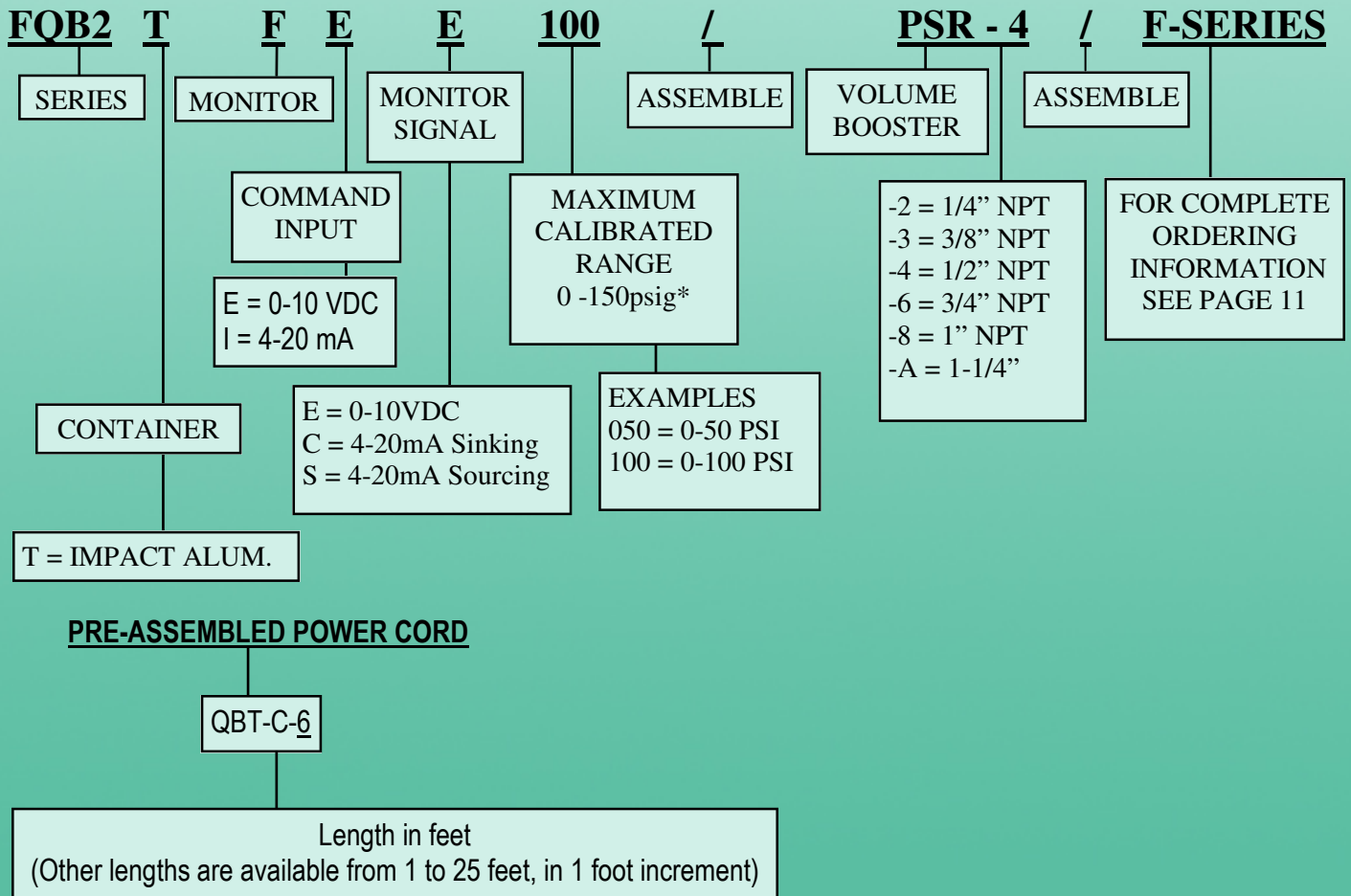


DIMENSIONS ARE FOR REFERENCE USE ONLY. DIMENSIONS ARE IN INCHES

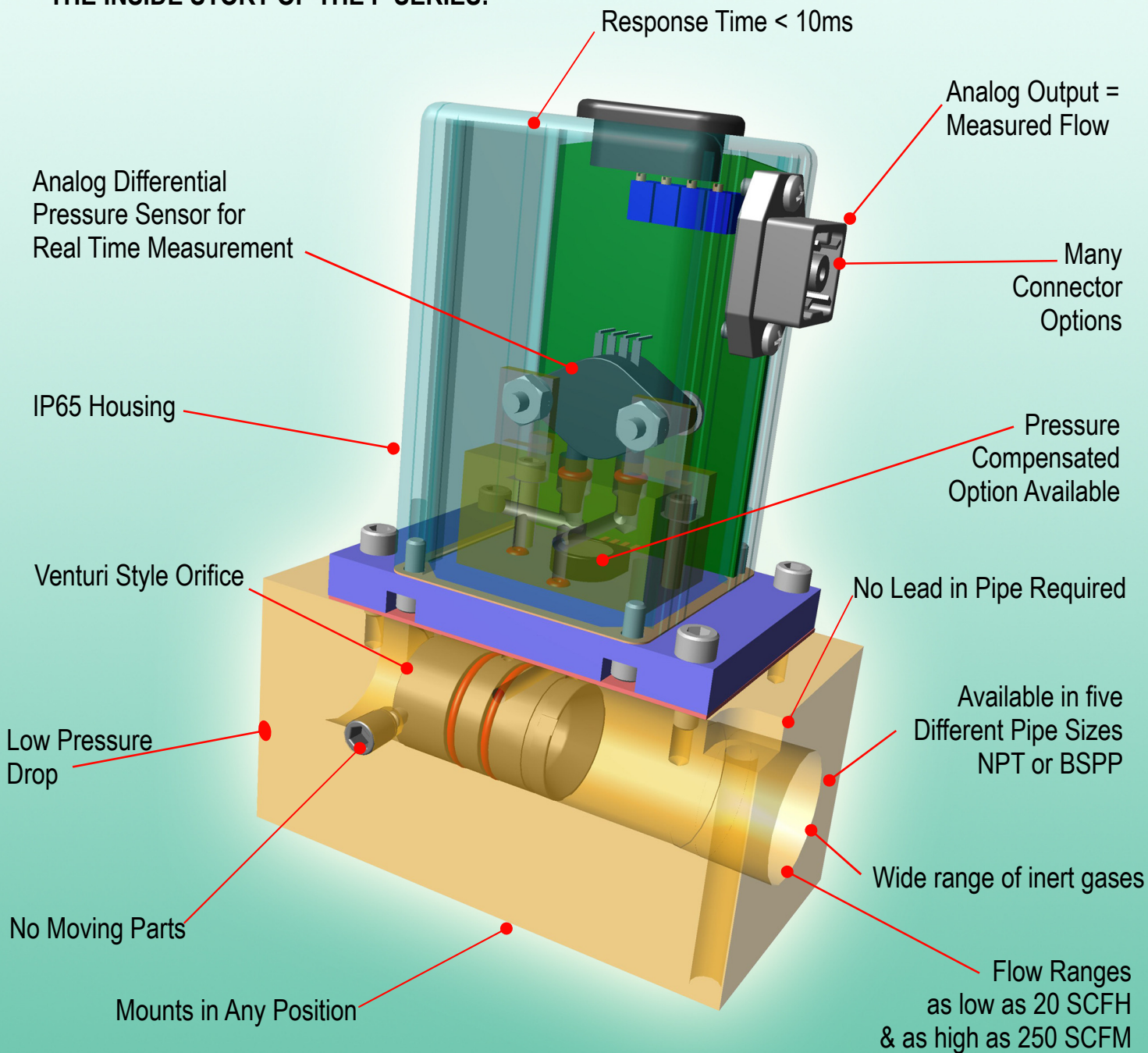


Assembly shown in 1/2" NPT model. For other port size assemblies, please consult factory.

## QB2-PSR ORDERING INFORMATION

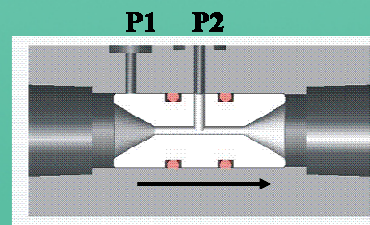


## THE INSIDE STORY OF THE F-SERIES:



## FUNCTIONAL DESCRIPTION

The Proportion-Air, Inc. F-series is a line of flow transducers designed specially to provide real time flow measurement of compressed gasses for many demanding applications. The Proportion-Air, Inc. F-series design utilizes differential pressure technology to sense the pressure change across an internal venturi. This differential pressure (DP) measurement is fed into an onboard electronic circuit that converts the DP signal into a linear analog output signal which represents the flow through the F-series. The DP sensor and circuit are completely analog to offer the fastest possible response time and eliminate digital stepping often seen in flow transducers of other technologies.

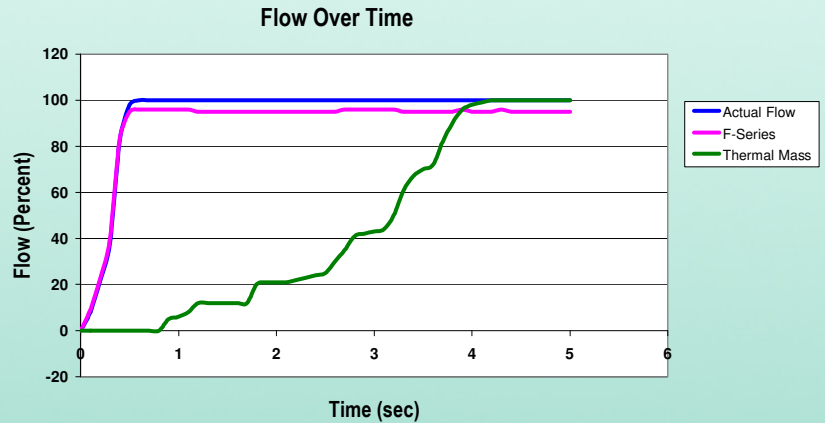




The Proportion-Air, Inc. F-series product is available in flow ranges from as low as 2 to 20scfh and as high as 25 to 250scfm. Pipe sizes range from ¼ " to 1 ½". Both NPT and BSP threads are available.

The differential pressure technology incorporated in the Proportion-Air, Inc. F-series flow transducer is ideally suited for rugged commercial and industrial applications. This technology allows measurements of flows from 10% to 100% of the maximum calibrated range. The benefits of real time measurement make the F-series a must in many rapid sequence applications. For example, in the chart below, the 0.1% accurate thermal mass flow meter output isn't even close while the F-series has been providing a 96% accurate signal for over four seconds! This makes the real accuracy of the F-series far superior in many fast paced applications.

The Proportion-Air, Inc. F-series flow transducer is rugged for today's demanding environments. It has an IP65 housing, 25G rating, and its large venturi can digest contaminants and moisture. The F-series is also insensitive to mounting position and vibration.

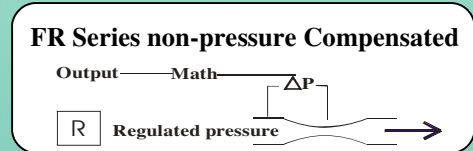


## F-SERIES MODELS

Three models of Proportion-Air, Inc. F-series flow transducer are available for a variety of different applications: Regulated, Pressure Compensated, and Atmosphere models.

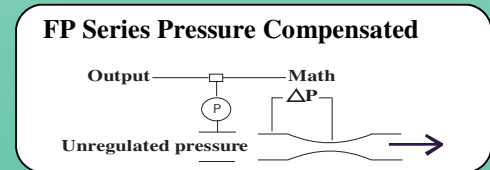
### FR MODEL

The FR model is a regulated flow monitor that uses only differential pressure to calculate the compressed gas flow. When the supply pressure of a compressed gas is regulated the compressible effect of the gas on gas density can be compensated for allowing the output signal to indicate implied mass flow.



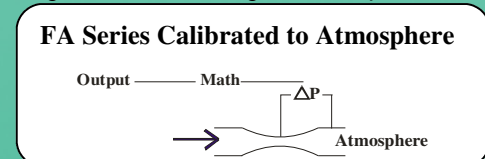
### FP MODEL

FP model is a pressure compensated flow monitor. In addition to a differential pressure sensor, the FP model also uses an absolute pressure sensor to measure the incoming pressure of the compressed gas flow. This absolute pressure allows the FP to mathematically correct the output signal for changes in gas density due to pressure. This model is used in applications where the incoming gas supply pressure varies and cannot be regulated or when there may be an advantage to eliminating a regulator.



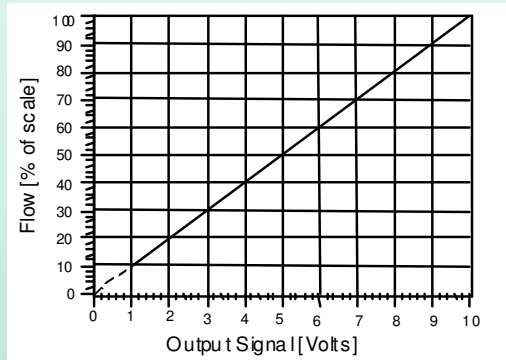
### FA MODEL

The FA model is an atmosphere flow monitor that is used where the compressed gas flow is venting to atmosphere. Atmospheric pressure becomes the standard against which the DP signal is compared allowing the DP signal to be mathematically converted to implied mass flow.



# PERFORMANCE CHARACTERISTICS

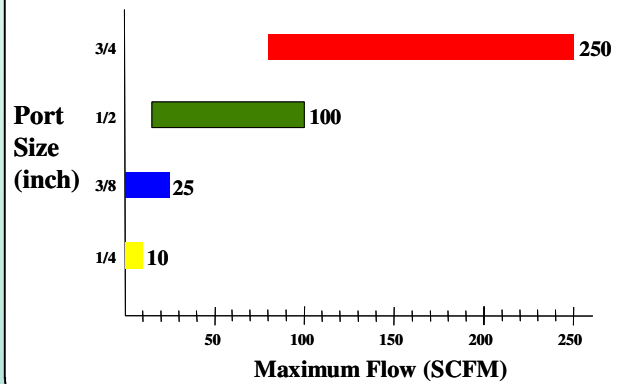
## LINEARITY



This chart shows linear characteristics of the F-series flow monitor with a signal output of 1-10 volts. Characteristics would be similar for 5.6-20 mA units.

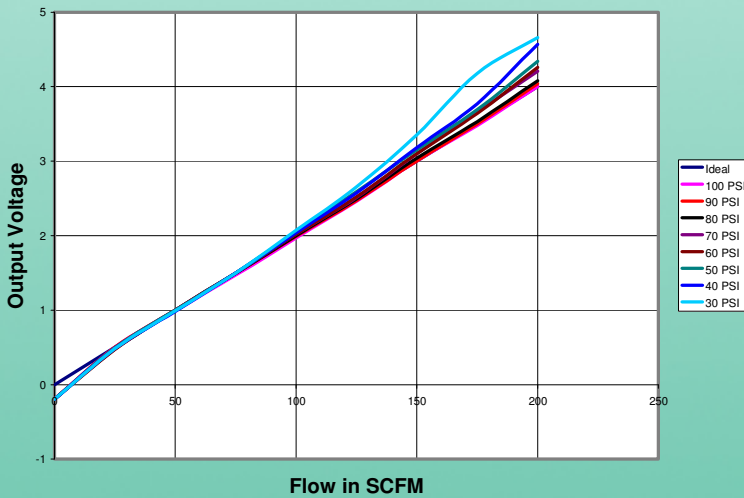
## CHART 1

Measured at 100psig



Port Selection Based on Maximum Flow

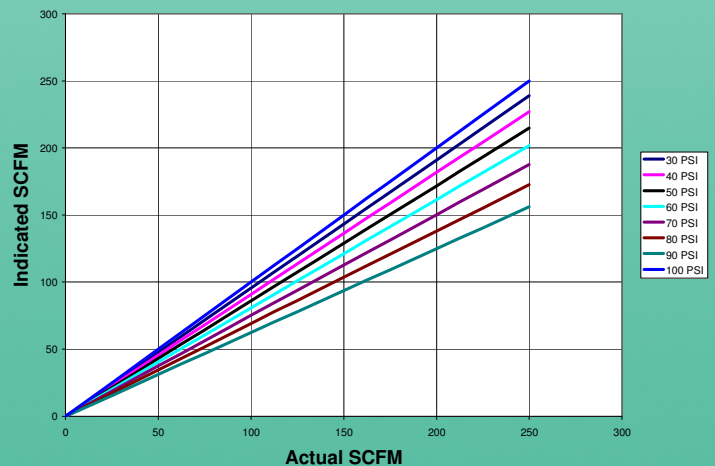
## PRESSURE COMPENSATED GRAPH



The pressure compensated graph shows the effect of the pressure compensated model at different pressures. If the supply pressure of the application is constant, a non-pressure compensated model can be used. (see "NON-PRESSURE COMPENSATED GRAPH")

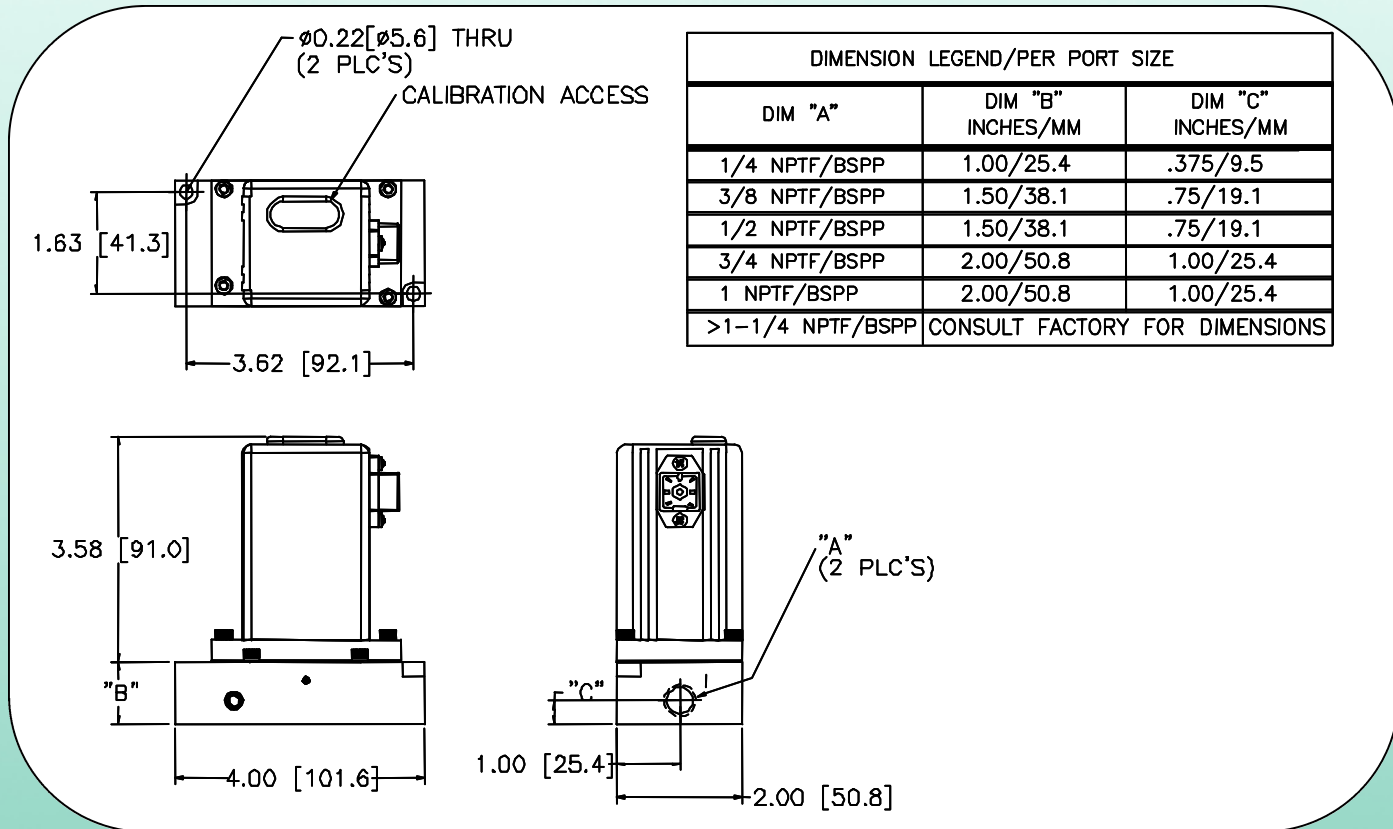
The non-pressure compensated graph represents the error in reading at different pressures. If the supply pressure in the application is not regulated or it fluctuates, we would recommend a pressure compensated model. (see "PRESSURE COMPENSATED GRAPH")

## NON-PRESSURE COMPENSATED GRAPH

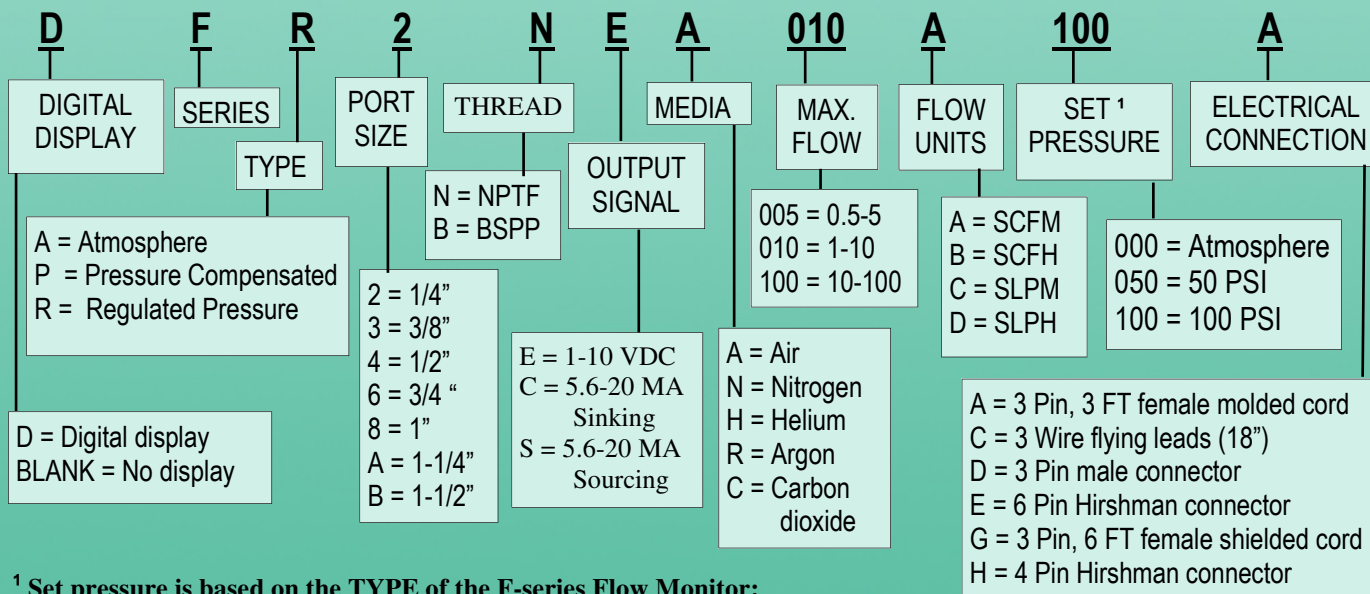


## DIMENSIONS F-SERIES

DIMENSIONS ARE FOR REFERENCE USE ONLY. DIMENSIONS ARE IN INCHES (MILLIMETERS)



## ORDERING INFORMATION

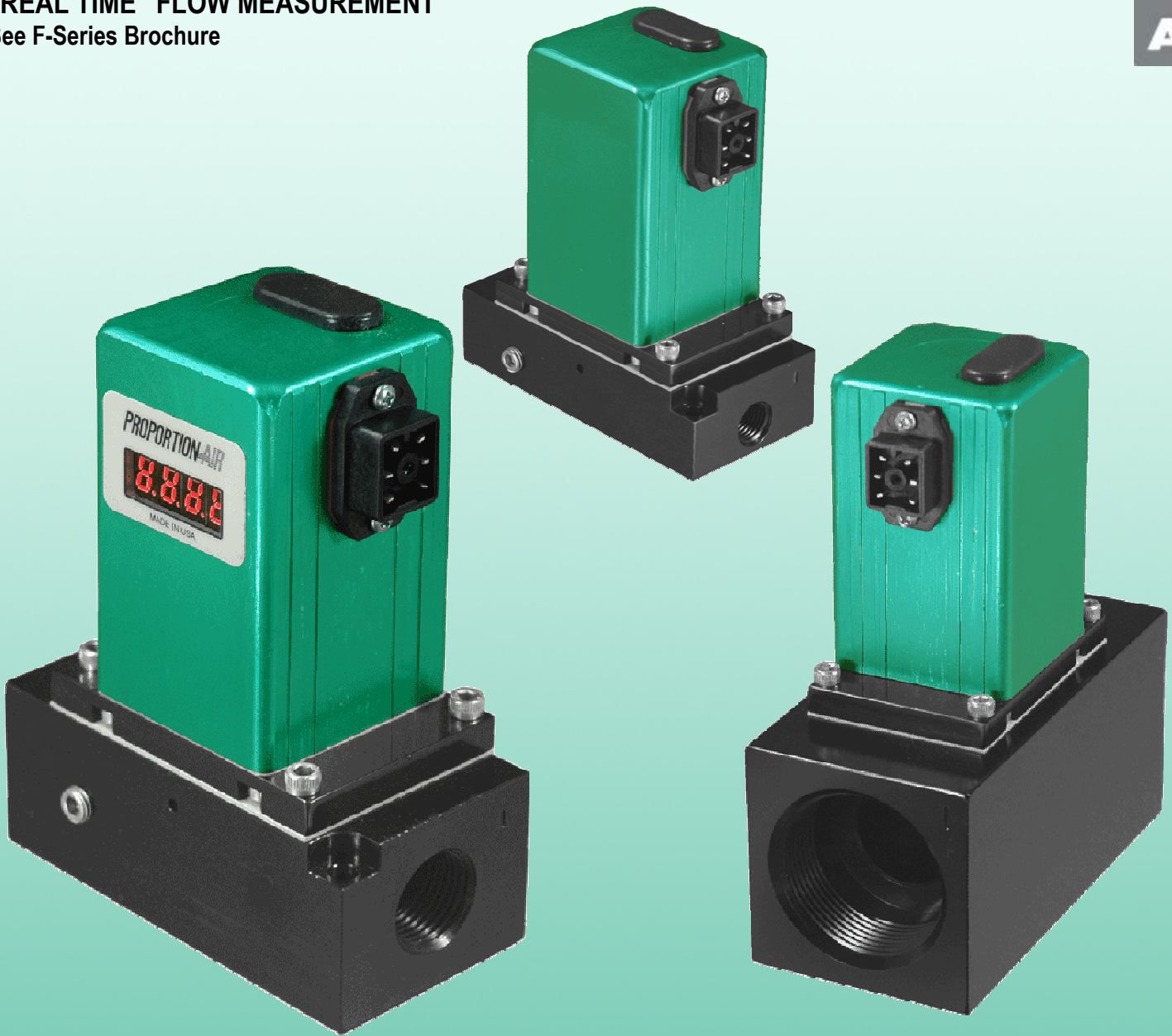


<sup>1</sup> Set pressure is based on the TYPE of the F-series Flow Monitor:

TYPE	SET PRESSURE
A	0 psig
P	Maximum system pressure, psia
R	Required regulated supply pressure, psig

**"REAL TIME" FLOW MEASUREMENT**  
See F-Series Brochure

**AVS**



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***WE MAKE ONE PRODUCT THOUSANDS OF WAYS***

Proportion-Air products are warranted to the original purchaser only against defects in material or workmanship for one (1) year from the date of manufacture. The extent of Proportion-Air's liability under this warranty is limited to repair or replacement of the defective unit at Proportion-Air's option. Proportion-Air shall have no liability under this warranty where improper installation or filtration occurred.

All specifications are subject to change without notice. **THIS WARRANTY IS GIVEN IN LIEU OF, AND BUYER HEREBY EXPRESSLY WAIVES, WARRANTIES OR LIABILITIES, EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY OBLIGATION OF PROPORTION-AIR WITH REGARD TO CONSEQUENTIAL DAMAGES, WARRANTIES OF MERCHANTABILITY, DESCRIPTION, AND FITNESS FOR A PARTICULAR PURPOSE.**

**WARNING:** Installation and use of this product should be under the supervision and control of properly qualified personnel in order to avoid the risk of injury or death.